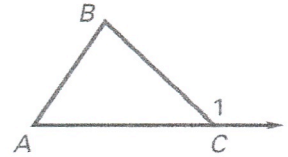


**THEOREM 4.2: EXTERIOR ANGLE THEOREM**

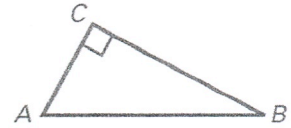
The measure of an exterior angle of a triangle is equal to the sum of the measures of the two nonadjacent interior angles.

$$m \angle 1 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}}$$

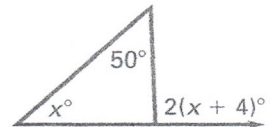
**COROLLARY TO THE TRIANGLE SUM THEOREM**

The acute angles of a right triangle are complementary.

$$m \angle A + m \angle B = \underline{\hspace{1cm}}$$

**Example 2 Finding an Angle Measure**

You can apply the Exterior Angle Theorem to find the measure of the exterior angle shown. First write and solve an equation to find the value of  $x$ :



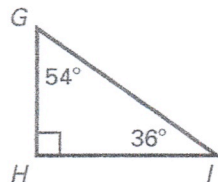
$$x^\circ + 50^\circ = 2(x + 4)^\circ \quad \text{Apply the Exterior Angle Theorem.}$$

$$\underline{\hspace{1cm}} = x \quad \text{Solve for } x.$$

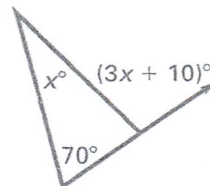
**Answer** So, the measure of the exterior angle is  $2 \cdot (\underline{\hspace{1cm}} + 4)^\circ$ , or  $\underline{\hspace{1cm}}^\circ$ .

**✓ Checkpoint** Complete the following exercises.

1. Classify the triangle by its angles and by its sides.



2. Find the measure of the exterior angle shown.



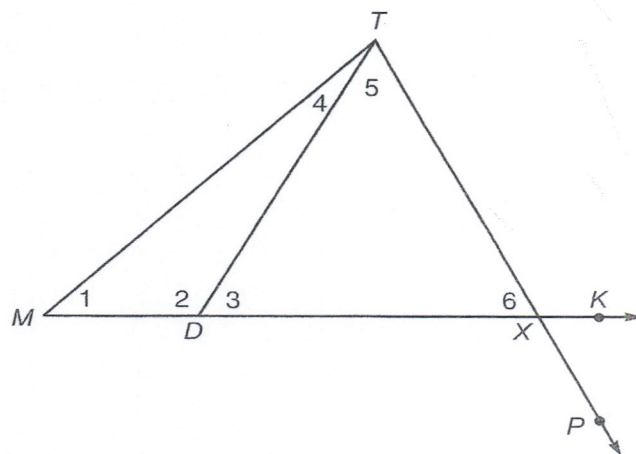
## Practice

4. Blue

### Exterior Angle Theorem

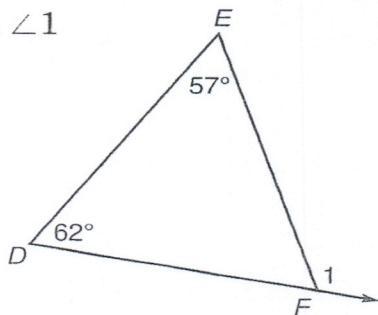
Name the angles.

1. an interior angle of  $\triangle MDT$
2. an interior angle of  $\triangle TDX$
3. an exterior angle of  $\triangle MTX$
4. an exterior angle of  $\triangle TDX$
5. a remote interior angle of  $\triangle TDX$  with respect to  $\angle 2$

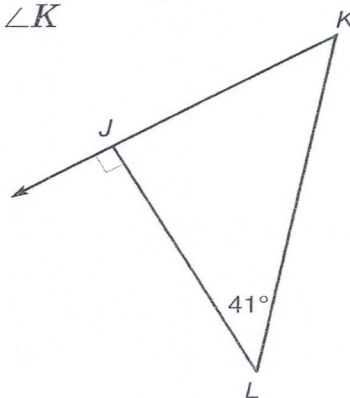


Find the measure of each angle.

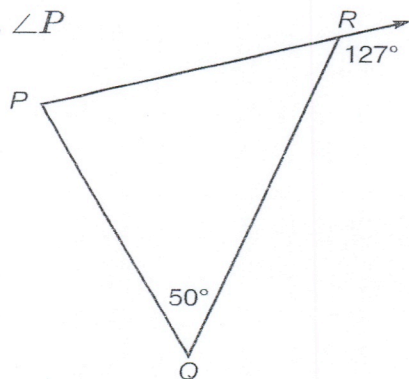
6.  $\angle 1$



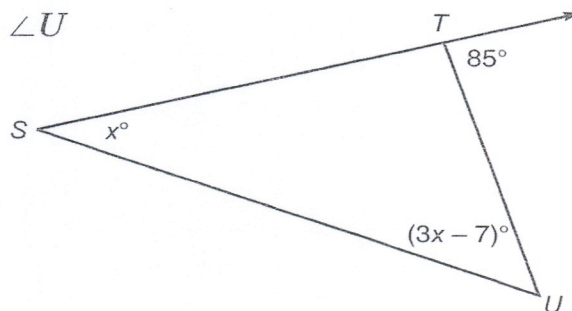
7.  $\angle K$



8.  $\angle P$



9.  $\angle U$





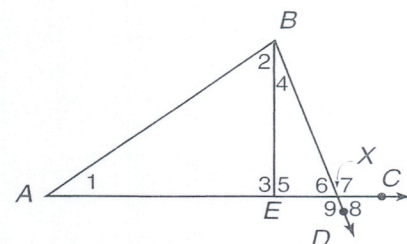
## Skills Practice

4.1 Blue

### Exterior Angle Theorem

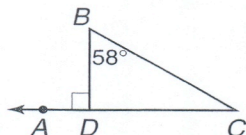
Name the angles.

1. an exterior angle of  $\triangle ABX$
2. an exterior angle of  $\triangle BEA$
3. an interior angle of  $\triangle ABX$
4. an interior angle of  $\triangle BEA$
5. a remote interior angle of  $\triangle ABX$  with respect to  $\angle 7$
6. a remote interior angle of  $\triangle BEA$  with respect to  $\angle 5$

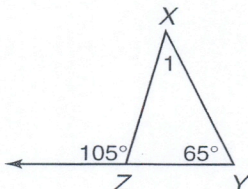


Find the measure of each angle.

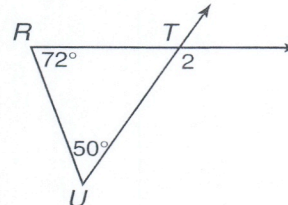
7.  $\angle C$



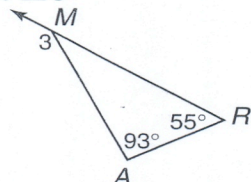
8.  $\angle 1$



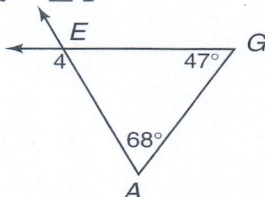
9.  $\angle 2$



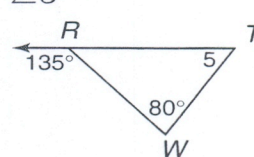
10.  $\angle 3$



11.  $\angle 4$

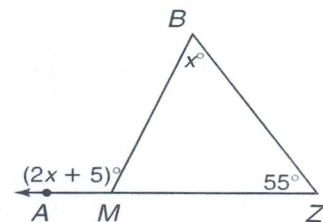


12.  $\angle 5$

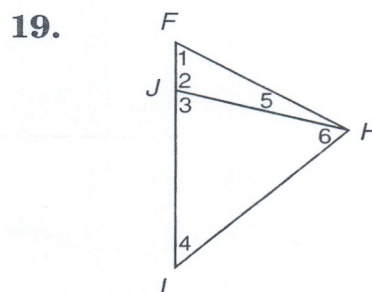
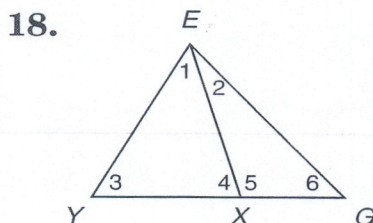
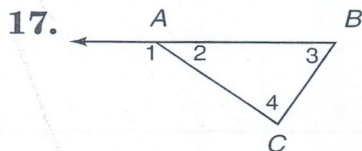


Use the figure at the right.

13. Find the value of  $x$ .
14. Find  $m\angle B$ .
15. Find  $m\angle BMA$ .
16. Find  $m\angle BMZ$ .



Replace each  $\bigcirc$  with  $<$ ,  $>$ , or  $=$  to make a true sentence.



$$m\angle 3 \bigcirc m\angle 1$$

$$m\angle 5 \bigcirc m\angle 3$$

$$m\angle 2 \bigcirc m\angle 4 + m\angle 6$$

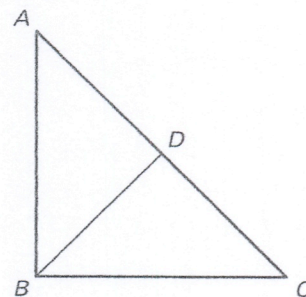


# Practice A

For use with pages 194–201

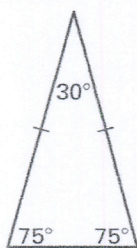
In the figure,  $\overline{AB} \cong \overline{BC}$  and  $\overline{BD} \perp \overline{AC}$ . Complete the sentence.

- $\overline{BC}$  is the \_\_\_\_\_ of right triangle  $\triangle BDC$ .
- $\overline{BD}$  is a \_\_\_\_\_ of right triangle  $\triangle BDC$ .
- $\overline{AC}$  is the \_\_\_\_\_ of isosceles triangle  $\triangle ABC$ .
- The legs of isosceles triangle  $\triangle ABC$  are \_\_\_\_\_ and \_\_\_\_\_.
- The legs of right triangle  $\triangle ADB$  are \_\_\_\_\_ and \_\_\_\_\_.

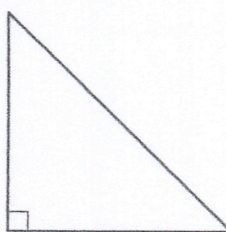


Classify the triangle by its angles and by its sides.

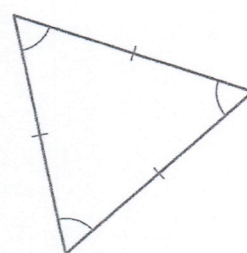
6.



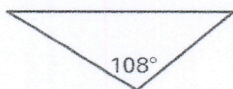
7.



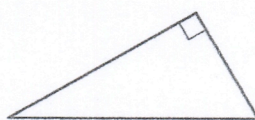
8.



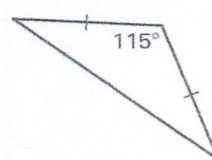
9.



10.



11.

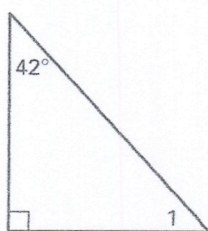


Classify the sentence with *always*, *sometimes*, or *never*.

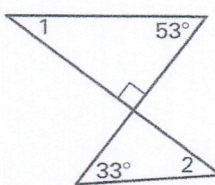
- An equilateral triangle is \_\_\_\_\_ an isosceles triangle.
- An isosceles triangle is \_\_\_\_\_ an equilateral triangle.
- A right triangle is \_\_\_\_\_ an acute triangle.
- An exterior angle of a triangle is \_\_\_\_\_ acute.

Find the measure of the numbered angle.

16.



17.



18.

